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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/304,830	05/05/1999	MASOUD SAJADIEH	SAJADIEH1-13	1222

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FARKAS AND MANELLI PLLC
2000 M STREET N W 7TH FLOOR
WASHINGTON, DC 200363307

EXAMINER

ABELSON, RONALD B

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 05/20/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/304,830

Applicant(s)

SAJADIEH ET AL.

Examiner

Ronald Abelson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-12 is/are rejected.
- 7) ☐ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/5/1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 6,341,140) in view of the Isaksson (US 5,652,772).

Regarding claims 1, 3, 7, and 10, Lee teaches a method and apparatus for frame/code synchronization in a multiplexed environment (multi-carrier direct sequence spread spectrum, col. 1 lines 8 -12). The system comprises a bandpass filter (fig. 2 box 21-2) and a correlator (fig. 2 box 24-2). The bandpass filter is adapted to remove a digital portion but not all of a signal corresponding to at least one digital channel from a received OFDM signal. Referring to figure 2, the Antenna Receiving Signal that is input to the bandpass filter (fig. 2 box 21-2) is the output from (fig. 1 box 16). This signal is an OFDM signal since each of the inputs (15-1 .. 15-m) is orthogonal to the others. Each bandpass filter (fig. 2 box 21-1 .. 21-m) is centered at (f_1 .. f_m) in order to pass only the digital channel (fig. 2 User Digital Data) that has been frequency shifted (fig. 1 box 15-1 .. 15-m) by an amount corresponding to the bandpass filter (fig. 2 box 21-1 .. 21-m). The portion of the output (fig. 1 box 16) that was multiplexed at different frequencies is removed.

Regarding claim 3, in addition to the limitations previously discussed, the bandpass filter is adapted to remove a

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significant portion of each of two digital channels from the received signal (fig. 2 box 21-2). The bandpass filter (fig. 2 box 21-2) removes a significant portion of the digital signals not centered at f_2 .

Although Lee teaches a frame synchronizing correlator in an OFDM environment (fig. 2 box 24-1 .. 24-m) the reference is silent on cyclic extension.

Isaksson teaches cyclic extension in an OFDM environment (PRBS-sequences, fig. 3,4, col. 1 lines 7 - 15, col. 3 line 62 - col. 4 line 7).

Therefore it would have been obvious to one of ordinary skill in the art, having both Lee and Isaksson before him/her and with the teachings [a] as shown by Lee, a bandpass filter and a correlator where the bandpass filter is adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal, and [b] as shown by Isaksson, synchronization of OFDM signals containing cyclic extension, to be motivated to modify the system of Lee by transmitting OFDM data with a cyclic extension. This modification could be performed in software by adding cyclic extension to each transmitted frame. This would improve the system of Lee by providing a time reference for sampling the data (Isaksson: col. 3 4-6).

Regarding claim 2, digital portion of at least one digital channel is a portion in a frequency domain farthest from the center frequency of an analog channel contained in the OFDM signal (Lee: fig. 2 box 21-1). The center frequency of the bandpass filter is f_1 , which is the frequency of the generated analog cosine signal transmitted (Lee: fig. 1 box 15-1).

Regarding claim 5, 8, and 11, the bandpass filter is digital (Lee: multi-carrier direct sequence spread spectrum communication, fig. 2 box 21-1, col. 2 lines 4-5).

Regarding claim 6, 9, and 12, sync signal based on an integrated detection of respectively correlated cyclically extended portions of a plurality of data frames (Lee: fig. 2 box 26, col. 3 lines 53-61). Note, cyclic extension previously discussed with reference to Isaksson.

Allowable Subject Matter

4. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, nothing in the prior art of the record teaches or fairly suggests the portion of the two digital channels are respective portions in a frequency domain farthest from a center frequency of an analog channel contained in the received OFDM signal, in combination with the other limitations listed in the claim. See applicant fig. 3.

Response to Arguments

5. Applicant's arguments filed 2/17/2004 have been fully considered but they are not persuasive.

The applicant argues that Lee does not teach a bandpass filter to "remove a portion of a signal corresponding to at least one digital channel from a received OFDM signal (applicant: pg. 5 last paragraph, pg. 6 1st paragraph). The examiner disagrees. Lee teaches a plurality of bandpass filters (fig. 2 box 21-1 .. 21-m) where each filter removes a portion of the received signal that contains digital data (fig. 1: User Digital Data) that has been frequency modulated (fig. 1: box 15-1 .. 15-m). Each bandpass filter removes a different portion of the frequency spectrum.

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The applicant further argues that Lee does not teach or suggest a frame sync signal generator, as previously stated in the prior office action, the examiner corresponds the applicant's OFDM frame synchronizing correlator adapted to generate a frame sync signal with the non-coherent correlator of Lee (fig. 2 box 24-1 .. 24-m).

Prior art is of record

6. The prior art is of record but not relied upon in the office action. Kaiser (US 6,188,717) teaches cyclic extension reduces intersymbol interference of OFDM symbols (col. 6 lines 44-48).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald Abelson whose telephone number is (703) 306-5622. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (703) 308-5463. The fax phone number for the

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organization where this application or proceeding is assigned is
.703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RA
Ronald Abelson
Examiner
Art Unit 2666

5/14/04

Seema S. Rao
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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800